

Relationship between 1-minute sit-to-stand and respiratory muscle strength in COPD

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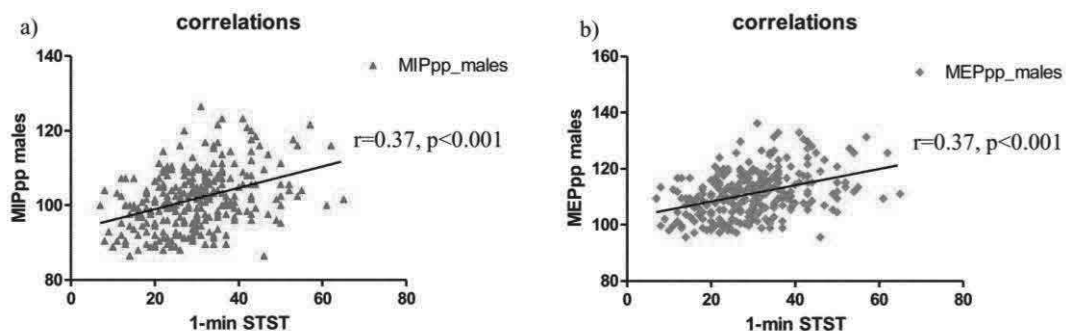
Background: It has been suggested that patients with chronic obstructive pulmonary disease (COPD) with respiratory muscle weakness achieve poorer results in exercise capacity tests, namely in the six-minute walk test (6MWT). The 1-minute sit-to-stand test (1-min STST) is simple to perform and a reliable and valid indicator of functional exercise capacity that correlates well with the 6MWT. However, its association with respiratory muscle strength in COPD is poorly studied.

Objective: To explore the relationship between the 1-min STST and maximum inspiratory (MIP) and expiratory pressures (MEP) in patients with COPD.

Methods: A cross-sectional study was conducted in the center and north regions of Portugal. Outpatients with COPD were recruited from routine pulmonology appointments. The 1-min STST and MIP/MEP were collected and predicted percentages (pp) of MIP/MEP were calculated using the equation set by Neder and colleagues. Correlations between the number of repetitions in the 1-min STST and MIPpp/MEPpp were explored by sex using Spearman coefficient correlation.

Results: 376 outpatients with COPD (66.3 ± 10.2 y; 76.1% ♂; FEV1 61.1 ± 23.4 pp; 101.6 ± 8.0 % ♂ MIPpp; 79.2 ± 5.2 % ♀ MIPpp; 110.9 ± 8.1 % ♂ MEPpp; 76.7 ± 6.5 % ♀ MEPpp) were included in this study. When the correlation was assessed by sex, low positive correlations were found between 1-min STST and MIP/MEPpp in males ($r=0.37$, $p<0.001$) (Fig.1). There was no significant correlation between 1-min STST and of MIP/MEPpp in females ($p>0.05$).

Figure 1 – a) Correlation between predicted maximum inspiratory pressure in male patients (MIPpp_males) and 1-minute sit-to-stand (1-min STST); b) Correlation between predicted maximum expiratory pressure in male patients (MEPpp_males) and 1-min STST.



Conclusion: 1-min STST correlated significantly with predicted respiratory muscle strength in male patients with COPD. Patients with respiratory muscle impairment seem to have worse functional capacity than those with better MIP and MEP. Thus, respiratory muscle training may play an important role in the improvement of functional capacity in patients with COPD with respiratory muscle weakness.

Keywords: COPD - management, exercise, respiratory muscle strength **Acknowledgments:**

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